

Talking Points -- IPCC Summary for Policymakers, Working Group I: Climate Change 2007: The Physical Science Basis

Background

- The Summary for Policymakers of the first volume of the Intergovernmental Panel on Climate Change's (IPCC) new and fourth assessment report "Climate Change 2007: The Physical Science Basis" was released on 2 February.
- The full report will be made available in mid-2007.
- The Summary for Policymakers captures and summarizes the current state of climate science research.
- This report does not cover the impacts of climate change on human health and the environment or options for the mitigation of climate change. These aspects will be covered in subsequent IPCC volumes to be finalized respectively in early April and May.

U.S. Involvement/Process

- The US government was a significant contributor to this report, with scientists serving as lead and review authors and providing comments in the official government review process – in which EPA was involved.
- NOAA served as the lead U.S. Agency for IPCC Working Group 1, contributing:
 - The report co-chair, Dr. Susan Solomon
 - 9 lead and review authors
 - 20 model runs from the Geophysical Fluid Dynamics Laboratory
- Official government delegations, including from the U.S., met in Paris 29 January - 1 February to approve the Summary for Policymakers line by line, and to accept the underlying report. The U.S. delegation to the IPCC included climate science experts from NASA and NOAA, and officials from the State Department and the White House Office of Science and Technology.

Major Themes

- Warming of the climate system is now "unequivocal." Compared to earlier assessments, considerable progress has been made in understanding how the climate is changing due to:
 - Improvements and extensions of numerous datasets and data analyses
 - Broader geographical coverage
 - A wider variety of measurements
 - Better understanding of uncertainties
- There is now increased confidence that human activities have caused most of the warming of the last 50 years. The report assigns greater than 90% certainty to this statement compared to 66-90% certainty in the last report published in 2001.
- The report conveys greater confidence in future climate change projections due to:
 - Larger number of climate model simulations from a broader range of models
 - More complex and realistic models

Key Summary Statements and Findings (edited for brevity/clarity)

- Greenhouse concentrations have increased markedly due to human activities since 1750 and are presently the highest they've been in many thousands of years.
- Carbon dioxide (CO₂) is having the largest heating effect, followed by methane (CH₄).
- Warming of the climate system is unequivocal, as is now evident from:
 - observations of increases in global average air and ocean temperatures
 - widespread melting of snow and ice
 - rising global average sea level
- Average Northern Hemisphere temperatures are likely the highest in at least the past 1300 years.
- Human activities have very likely caused most of the warming of the last 50 years.
- Continued greenhouse gas emissions (at or above current rates) would cause warming and many additional climate changes, very likely larger than changes observed during the 20th century.
- Best estimate for temperature change in 2090-2099 relative to 1980-1999 is 1.8 to 4°C (3.4 to 7.2 °F), considering a range of future emission pathways. New temperature projections arise from a larger number of climate models which are more complex and realistic than models used in earlier assessments.
- Sea levels are projected to rise 0.19-0.59m but there are considerable uncertainties about future contributions to sea level rise from the Greenland and Antarctic Ice.
- It is likely future tropical cyclones (typhoons and hurricanes) will become more intense, with larger peak wind speeds and heavier precipitation. There is less confidence in projections for a decrease in the number of tropical cyclones.
- It is very likely that hot extremes, heat waves, and heavy precipitation events will continue to become more frequent.
- Reductions in snow cover and sea ice are projected. In some projections, Arctic late-summer sea ice disappears almost entirely by the latter part of the 21st century.
- Anthropogenic warming and sea level rise would continue for centuries (due to life time of greenhouse gases in the atmosphere and the capacity of the ocean to store and slowly release heat) even if greenhouse gas concentrations were stabilized today.

What is the U.S. Government Doing on Climate Science and Policy?

- The U.S. leads the world in advancing climate science and addressing our impact on Earth's climate, with President Bush devoting nearly \$29 billion to climate-related science, technology, international assistance, and incentive programs - more than any other country.
- Putting research and development to work, this Administration's policy to deploy cleaner, more efficient technologies is putting the U.S. well on track to meet the President's goal of reducing greenhouse gas intensity 18 percent by 2012.
- Since 2002, the Administration has spent approximately \$9 billion on climate change science research through the multi-agency Climate Change Science Program. These investments, along with input from U.S. scientists and federal resources led to the development of (many of) the research results summarized in the IPCC report.

Complex/uncertain science issues

- Report's projected sea level rise range of 0.18-0.59m is a decrease from 2001 projection of 0.09-0.88m (for the upper range). But:
 - Revised estimate range includes projections for increased precipitation over Antarctica and Greenland (which decreases its contribution to sea level rise) but not the increased ice discharge from these ice sheets which are currently contributing to sea level rise.
 - If current sea ice contribution grows linearly with temperature change, the upper range of sea level rise projections would increase by 0.1 to 0.2m.
- The IPCC concluded that it is “more likely than not” that human activities are linked to recent observed increases in tropical cyclone intensity. The rationale for this statement was:
 - Sea surface temperatures have risen in tropical development regions, and attribution studies conclude the increase in temperatures cannot be explained by natural variability alone.
 - Observational studies show a trend towards more intense tropical cyclones in some regions (where ocean temperatures have warmed) since 1970.
- Studies have not assessed the magnitude of the possible anthropogenic contribution to the intensity trend. The attribution is based on expert judgment (given the points above) rather than formal studies.